



Zarqa University

Faculty: Information Technology

Department: Software Engineering

Course title: Software Verification and Validation
(1503712)

Instructor: Dr. Issam Jebreen

Lecture's time: Sat 1 – 4 PM

Semester: First 2017/2018

Office Hours: 3

Course Description

This course will address topics in the verification and validation (V&V) of software. Verification addresses issues related to whether the system is correct (with respect to some specification); validation addresses the question whether the right system was built. Topics include the depth study of verification and validation strategies and techniques as they apply to the development of quality, software test planning and management, testing of software throughout its life cycle. Unit and system level testing. Design a Black box and white box test cases, and Measure test effectiveness, and Regression test and Integration testing. The relationship of testing to other quality assurance activities as well as the integration of verification and validation into the overall software development process are also discussed.

Aims of the course:

This Module introduces various methods, techniques and tools for testing Software Systems. Students learn how to model test purposes, experiment and test hypothesis, perform various level testing using different testing techniques, use metrics to establish conformance to system design requirements, concepts of formal verification. The course also looks at how software quality assurance is performed.

Intended Learning Outcomes: (ILOs)

- A. Knowledge and Understanding
 - A1. Concepts and Theories: List the basic of software Testing terminologies. List the concept of Software Testing process. List the concept of Integration testing. List the concept of OO testing.
 - A2. Contemporary Trends, Problems and Research:
 - A3. Professional Responsibility:
- B. Subject-specific skills
 - B1. Problem solving skills: Learn How to use testing techniques to build confidence.
 - B2. Modeling and Design: Learn How to build Test cases.
 - B3. Application of Methods and Tools: Learn How To use OO testing technique.
- C. Critical-Thinking Skills
 - C1. Analytic skills: Assess Distinguish between OO testing and Structural Testing.
 - C2. Strategic Thinking: Understanding Techniques and methods of Software Testing.
 - C3. Creative thinking and innovation: Analyze and investigate Source Code for testing purposes
- D. General and Transferable Skills (other skills relevant to employability and personal development)
 - D1. Communication:
 - D2. Teamwork and Leadership: Discuss and work in a group in order to study several cases, each of which has issues affecting the software testing in such a way.



Course structures:

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	A1	<ul style="list-style-type: none"> Introduction to Software Testing 	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Mid exam c) writing a paper d) presentation
2	3	A1	<ul style="list-style-type: none"> Literature review protocol in software testing Proposal writing for software testing research 	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Mid exam c) writing a paper d) presentation
3	3	A1, B1	<ul style="list-style-type: none"> V & V 	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Mid exam



					c) writing a paper d) presentation
4,5	6	A1,B1,B2	<ul style="list-style-type: none"> • Test adequacy 	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Mid exam c) writing a paper d) presentation
6,7	5	B1, C1	<ul style="list-style-type: none"> • Integration Testing 	Presentation methods and techniques, Sources of information and Instructional Aids	Diagnostic tests to identify the students level and areas of weakness Formal (stage) evaluation a) Class Participation b) Mid exam c) writing a paper d) presentation

7,8	4	A1,B1,B2	<ul style="list-style-type: none"> Integration Testing 	<p>Presentation methods and techniques, Sources of information and Instructional Aids</p>	<p>Diagnostic tests to identify the students level and areas of weakness</p> <p>Formal (stage) evaluation</p> <p>a) Class Participation</p> <p>b) Mid exam</p> <p>c) writing a paper</p> <p>d) presentation</p>
9,10	4	A1, B2, B3	<ul style="list-style-type: none"> Usability testing 	<p>Presentation methods and techniques, Sources of information and Instructional Aids</p>	<p>Diagnostic tests to identify the students level and areas of weakness</p> <p>Formal (stage) evaluation</p> <p>a) Class Participation</p> <p>b) Mid exam</p> <p>c) writing a paper</p> <p>d) presentation</p>
10,11	4	A1, B2, B3, C1,C2,C3	<ul style="list-style-type: none"> Regression testing 	<p>Presentation methods and techniques, Sources of information and Instructional Aids</p>	<p>Diagnostic tests to identify the students level and areas of weakness</p> <p>Formal (stage) evaluation</p> <p>a) Class Participation</p> <p>b) Mid exam</p> <p>c) writing a paper</p>



					d) presentation
11,12	4	A1, B2, B3, D1, D2	<ul style="list-style-type: none"> Automated test generation 	Presentation methods and techniques, Sources of information and Instructional Aids	<p>Diagnostic tests to identify the students level and areas of weakness</p> <p>Formal (stage) evaluation</p> <p>a) Class Participation</p> <p>b) Mid exam</p> <p>c) writing a paper</p> <p>d) presentation</p>
13, 14	5	A1,B1,B2	<ul style="list-style-type: none"> Automated test generation 	Presentation methods and techniques, Sources of information and Instructional Aids	<p>Diagnostic tests to identify the students level and areas of weakness</p> <p>Formal (stage) evaluation</p> <p>a) Class Participation</p> <p>b) Mid exam</p> <p>c) writing a paper</p> <p>d) presentation</p>



References

A. Main Textbook:

Foundations of Software Testing, Aditya P. Mathur, , 1st Edition, Addison-Wesley Professional, 2015.

B. Supplementary Textbook(s):

Software Engineering, Pressman R., 2002, 5th edition, McGraw Hill.

Introduction to Software Testing, Paul Ammann and George Mason Jeff Offutt, Cambridge University Press, 2008

Testing Computer software, Kaner C., Falk J., Hung Quoc Nguyen, 1999, 2nd edition John Wiley & Sons, Inc.

Software Engineering & testing an Introduction, B. B. Agrawl, S. P. Tayal and M. Gupta, Jones and Bartlett Publishers, 2010.

The Art of Software Testing, Glenford J., Tom Badgett and Corey Sandler, 3rd edition, 2012, John Willy & sons, Inc.

Software Engineering, Sommerville I., 2005, 7th edition, Pearson education limited.

Software Testing: Craftsman Approach, Paul C. Jorgensen, 1995, CRC Press.

Software Quality Assurance from Theory to Practice, Deniel Gabin, 2004, Addison Wesley.

Lessons Learned in Software Testing: A Context Driven Approach, Cem Kaner, 2002, John Wiley and Sons

Effective Methods for Software Testing, William E. Perry, 2000, John Wiley and Sons.

Assessment Methods:

Methods	Grade	Date
Mid Exam	30%	
Paper and presentation	30%	
Final	40%	

Paper and Presentation

Each student will select a topic that relates to the content of this course and write a paper on that topic. The choice of topic is left to the student, mostly. The course instructor must approve the topic. The topic must be one that is not otherwise substantially covered in this course or another course. You may choose to write a review of case studies, or a review of available software tools, etc...

The paper must be at least 8 double-spaced pages, no more than 15 pages, in 12pt Times Roman font with 1" margins.

Use appropriate citations!

Each student must present her/his findings in class. Presentation should take 20-30 minutes